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WRF4SG

WS-PGRADE/gUSE

gUSE (grid User Support Environment) is a DCI virtualization environment providing a scalable set of high-level services by which interoperability between DCIs and user communities can be achieved.

The WS-PGRADE Portal is a web portal of the gUSE and it is the second generation P-GRADE portal that introduces many advanced features both at the workflow and architecture level. It supports development and submission of distributed applications executed on the computational resources of various distributed computing infrastructures (DCIs) including clusters, service grids (ARC, gLite, Globus, UNICORE), BOINC desktop grids and Google App Engine cloud.

It explicitly distinguishes between two different types of user communities: application developers and end-users. Through a dedicated view, the application developers have access to all the advanced workflow features (graph, abstract workflow, template, application and project) to develop new workflow applications.

The built-in gUSE repository stores the workflow objects published by the application developers, to be downloaded and further developed by the community. The gUSE repository provides a forum for collaboration and enables workflow sharing between application developers.

The newest version is available for download from SourceForge : [?gUSE Download](#)

Interesting Presentations

[Introduction to WS-PGRADE](#)

[How to create a WS-PGRADE workflow?](#)

[Application Specific Module overall](#)

[Application Specific Module Details](#)

[My First Workflow Advanced Workflow](#)

Architecture

The release of gUSE comes together with the Liferay-based WS-PGRADE portal. gUSE is a set of high-level grid services (including workflow manager, storage, broker, grid-submitters for various types of grids, etc. services). It also includes a graphical portal service based on Liferay technology.

gUSE is implemented as a set of Web services that bind together in flexible ways on demand to deliver user services in Grid and/or Web services environments. User interfaces for gUSE services are provided by the WS-PGRADE Web application.

The lowest level of the architecture is the services of Web service, Grid service networks. Grid services typically provide job execution, large scale file storage and brokering services in a secured way, while Web services make pre-defined computational algorithms accessible via SOAP messages. gUSE services connect to this tier to perform computation, data management on behalf of the users.

WS-PGRADE

The new release of gUSE comes together with the Liferay-based WS-PGRADE portal. It also includes a graphical portal service based on Liferay technology.

User interfaces for gUSE services are provided by the WS-PGRADE Web application. WS-PGRADE is a Web portal hosted in a standard portal framework. WS-PGRADE uses the client APIs of gUSE services to turn user requests into sequences of gUSE specific Web service calls. WS-PGRADE hides the communication protocols and sequences behind JSR286 compliant portlets. End users can access WS-PGRADE via Web browsers. A graph editor component can be downloaded from WS-PGRADE via the browser to the user machine. The editor can be used to define the static skeleton of workflows, while the HTML pages of WS-PGRADE provide interfaces to add content to graphs, to generate complete Grid/Web service applications

DCI-Bridge

DCI-Bridge is implemented as a set of Web services that bind together in flexible ways on demand to deliver user services in Grid and/or cluster and/or cloud and/or Web services environments.

DCI Bridge is a web application (service) that provides standard access to the distributed computing infrastructures (DCIs) like grids, desktop grids, clusters, clouds and service based computational resources by implementing the specification of the OGSA Basic Execution Service 1.0.

The DCI Bridge web application creates a transparent layer between the users (workflow systems) and the DCI systems. The user can submit jobs to the various DCI systems using the OGSA Basic Execution Service (BES) interface defined [?here](#). As a result, the users do not have to learn the access protocol of the various DCI systems since they are hidden behind the BES interface.

The DCI Bridge gives support to the use of the Meta Broker which is able to choose the most ideal environment for the job from the available execution resources. The DCI Bridge will do the task in this specified environment.

- Resource registry
 - Online configuration interface
 - ResourceConfiguration service
- Runtime system
 - BESFactoryService service
 - Job registry
 - Proxy manager
 - Executor layer handler
 - Input queue
 - Meta Broker client
 - Middleware plugin and queue handler
 - Output queue
 - Status manager
- Application management
 - BESManagement and online interface for its use
- Monitor
 - Application monitor + online interface
 - Plugin monitor + online interface
 - Job monitor + online interface

The job of the Resource Registry subsystem is to provide an online configuration interface to be able to configure the resources which can be called by the DCI Bridge. Also it provides information about the configured resources to other external software components. For the configuration of the resources an online interface is available which is part of the web application. The access to this interface is controlled with container authentication. The available resource publishing goes through on the ResourceConfiguration service which is accessible with http/https protocol as a generic web service.

The job of the Application Management subsystem is the implementation of BES-Management Port-type from the fifth volume of the OGSA Basic Execution Service 1.0 specification which makes possible to supervise the software based access of the BES Factory service.

The Runtime System does the effective job running. The subsystem can be called with a service made by OGF which implements the BES WSDL and it makes the operations defined by the OGSA Basic Execution Service 1.0 specification on different grid/cloud/service based middlewares. The separate running systems can be handled with plugins and their numbers can be increased without any restriction.

The job of the Monitor subsystem is to handle and visualize the logs and messages of the DCI Bridge, the plugins and the running jobs.

Connected middlewares

- [?GT2](#), [?GT4](#), [?GT5](#)
- [?GEMLCA](#)
- [?qLite](#)
- [?PBS](#)
- [?GAE](#)
- [?UNICORE](#)
- [?ARC](#)
- [?LSF](#)
- [?BOINC](#)
- [?GBAC](#)
- [?CloudBroker](#)

Core Services

gUSE is a set of high-level grid services (including workflow manager, storage). gUSE runs jobs in the DCI Bridge. gUSE services can be hosted on a single host or can be distributed over several server machines to optimize resource usage or increase performance.

gUSE services provide data services (user database, proxy credential database, application code database, workflow database, application history and change log database, etc.) and control services (e.g. job submission, workflow enactment, etc.). gUSE services discover each other using a central gUSE service, the information system.

Documentation

If you want to see more information about WS-PGRADE/gUSE, you can check out [?documentation](#)